

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A digital protection [[and]]/_control device, comprising:
 - a digital data merging unit configured to take in, via a transmission medium, digital output from one sensor unit or a plurality of sensor units detecting AC electricity quantities of main circuits of substation main equipment and to merge the inputted digital data;
 - a protection [[and]]/_control unit configured to output a control signal for at least one of protection and control of said substation main equipment based on the digital data outputted from said digital data merging unit;
 - a communication unit for component control devices configured to transmit to said protection [[and]]/_control unit component monitor data outputted from one component control device or a plurality of component control devices controlling said substation main equipment, and to transmit the control signal outputted from said protection [[and]]/_control unit to said component control device(s), the component monitor data and the control signal being transmitted via a transmission medium;
 - a process bus communication unit configured to relay data to/from at least a part of said protection [[and]]/_control unit, said communication unit for component control devices, and said digital data merging unit from/to an external process bus; and
 - a parallel transmission medium configured to couple at least parts of said digital data merging unit, said protection [[and]]/_control unit, said communication unit for component control devices, and said process bus communication unit to one another, wherein:
 - data exchange among at least parts of said digital data merging unit, said protection [[and]]/_control unit, said communication unit for component control devices, and said process bus communication unit is based on a multimaster mode; and

at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control device, and said process bus communication unit have a storage section that stores data and that is allocated to a storage space of a bus coupling at least said parts to each other, and data exchange between at least said parts is conducted in such a manner that data is transferred to the storage section based on the allocation.

2. (Currently Amended) ~~A digital protection and control device as set forth in claim 1, wherein at least a part of data exchange among said digital data merging unit, said protection and control unit, said communication unit for component control devices, and said process bus communication unit is based on a single master mode instead of the multimaster mode.~~ A digital protection / control device, comprising:

a digital data merging unit configured to take in, via a transmission medium, digital output from one sensor unit or a plurality of sensor units detecting AC electricity quantities of main circuits of substation main equipment and to merge the inputted digital data;

a protection / control unit configured to output a control signal for at least one of protection and control of said substation main equipment based on the digital data outputted from said digital data merging unit;

a communication unit for component control devices configured to transmit to said protection / control unit component monitor data outputted from one component control device or a plurality of component control devices controlling said substation main equipment, and to transmit the control signal outputted from said protection / control unit to said component control device(s), the component monitor data and the control signal being transmitted via a transmission medium;

a process bus communication unit configured to relay data to/from at least a part of said protection / control unit, said communication unit for component control devices, and said digital data merging unit from/to an external process bus; and

a parallel transmission medium configured to couple at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control devices, and said process bus communication unit to one another, wherein:

data exchange among at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control devices, and said process bus communication unit is based on a single master mode.

3. (Currently Amended) A digital protection ~~[[and]]~~ / control device as set forth in claim 1, wherein:

a transmission bus coupling said digital data merging unit, said protection ~~[[and]]~~ / control unit, said communication unit for component control devices, and said process bus communication unit to one another, and a transmission bus in said process bus communication unit are based on a common transmission mode, and the transmission bus in said process bus communication unit has a bridge.

4. (Cancelled)

5. (Currently Amended) ~~A digital protection and control device as set forth in claim 1;~~ A digital protection / control device, comprising:

a digital data merging unit configured to take in, via a transmission medium, digital output from one sensor unit or a plurality of sensor units detecting AC electricity quantities of main circuits of substation main equipment and to merge the inputted digital data;

a protection / control unit configured to output a control signal for at least one of protection and control of said substation main equipment based on the digital data outputted from said digital data merging unit;

a communication unit for component control devices configured to transmit to said protection / control unit component monitor data outputted from one component control device or a plurality of component control devices controlling said substation main equipment, and to transmit the control signal outputted from said protection / control unit to said component control device(s), the component monitor data and the control signal being transmitted via a transmission medium;

a process bus communication unit configured to relay data to/from at least a part of said protection / control unit, said communication unit for component control devices, and said digital data merging unit from/to an external process bus; and

a parallel transmission medium configured to couple at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control devices, and said process bus communication unit to one another, wherein:

data exchange among at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control devices, and said process bus communication unit is based on a multimaster mode; and

~~wherein~~ said protection ~~[[and]]~~ / control unit executes a protective relay arithmetic operation based on a reference signal for protective relay arithmetic operation whose period is substantially integer times a period of a sampling signal used by said sensor unit(s) for sampling detection of the AC electricity quantities.

6. (Currently Amended) A digital protection ~~[[and]]~~ / control device as set forth in claim 5, further comprising:

a unit configured to generate a reference signal for time synchronization synchronous with a reference signal used for generating the sampling signal and to generate the reference signal for protective relay arithmetic operation, wherein:

at least a part of the control over said substation main equipment is synchronized with the reference signal for time synchronization, and at least a part of the protection of said substation main equipment is synchronized with the reference signal for protective relay arithmetic operation.

7. ~~A digital protection and control device as set forth in claim 1,~~ A digital protection / control device, comprising:

a digital data merging unit configured to take in, via a transmission medium, digital output from one sensor unit or a plurality of sensor units detecting AC electricity quantities of main circuits of substation main equipment and to merge the inputted digital data;

a protection / control unit configured to output a control signal for at least one of protection and control of said substation main equipment based on the digital data outputted from said digital data merging unit;

a communication unit for component control devices configured to transmit to said protection / control unit component monitor data outputted from one component control device or a plurality of component control devices controlling said substation main equipment, and to transmit the control signal outputted from said protection / control unit to said component control device(s), the component monitor data and the control signal being transmitted via a transmission medium;

a process bus communication unit configured to relay data to/from at least a part of said protection [[and]] / control unit, said communication unit for component control devices, and said digital data merging unit from/to an external process bus; and

a parallel transmission medium configured to couple at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control devices, and said process bus communication unit to one another, wherein:

data exchange among at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control devices, and said process bus communication unit is based on a multimaster mode; and

~~wherein~~ said protection ~~[[and]] / control section unit~~ transmits said control signal with a predetermined period synchronized with a processing period of protecting or controlling in said protection / control unit to said component control device, and said component control device monitors status event of said substation main equipment ~~based on by a sampling~~ synchronized with a timing at which said component control device receives the control signal.

8. (Currently Amended) A digital protection ~~[[and]] / control device~~ as set forth in claim 7, wherein:

said protection ~~[[and]] / control unit~~ cyclically appends identification data to said control signal transmitted with the predetermined period, and said component control device generates a timing in accordance with presence or non-presence of the appending of the identification data to the received control signal and controls said substation main equipment at said timing.

9. (Currently Amended) ~~A digital protection and control device as set forth in claim 1, further comprising: a mechanical or static relay section configured to ON/OFF output the control signal to said component control device; and an insulated input section configured to~~

~~ON/OFF input said data input thereto from said component control device.~~ A digital protection / control device, comprising:

a digital data merging unit configured to take in, via a transmission medium, digital output from one sensor unit or a plurality of sensor units detecting AC electricity quantities of main circuits of substation main equipment and to merge the inputted digital data;

a protection / control unit configured to output a control signal for at least one of protection and control of said substation main equipment based on the digital data outputted from said digital data merging unit;

an input / output unit for component control devices which is not adaptable to the digitization of a transmission medium, configured to transmit to said protection / control unit component monitor data outputted from one component control device or a plurality of component control devices controlling said substation main equipment, and to output the control signal outputted from said protection / control unit to said component control device(s), and has a mechanical or static relay section configured to ON/OFF output the control signal to said component control and an insulated input section configured to ON/OFF input said data input thereto from said component control device;

a process bus communication unit configured to relay data to/from at least a part of said protection / control unit, said input / output unit for component control devices, and said digital data merging unit from/to an external process bus; and

a parallel transmission medium configured to couple at least parts of said digital data merging unit, said protection / control unit, said input / output unit for component control devices, and said process bus communication unit to one another, wherein:

data exchange among at least parts of said digital data merging unit, said protection / control unit, said input / output unit for component control devices, and said process bus communication unit is based on a multimaster mode.

10. (Currently Amended) ~~A digital protection and control device as set forth in claim 1;~~ A digital protection / control device, comprising:

a digital data merging unit configured to take in, via a transmission medium, digital output from one sensor unit or a plurality of sensor units detecting AC electricity quantities of main circuits of substation main equipment and to merge the inputted digital data;

a protection / control unit configured to output a control signal for at least one of protection and control of said substation main equipment based on the digital data outputted from said digital data merging unit;

a communication unit for component control devices configured to transmit to said protection / control unit component monitor data outputted from one component control device or a plurality of component control devices controlling said substation main equipment, and to transmit the control signal outputted from said protection / control unit to said component control device(s), the component monitor data and the control signal being transmitted via a transmission medium;

a process bus communication unit configured to relay data to/from at least a part of said protection / control unit, said communication unit for component control devices, and said digital data merging unit from/to an external process bus; and

a parallel transmission medium configured to couple at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control devices, and said process bus communication unit to one another, wherein:

data exchange among at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control devices, and said process bus communication unit is based on a multimaster mode; and

~~wherein~~ said digital protection ~~[[and]]~~/control device is coupled to an external input/output device by a transmission medium, and exchange data with said component control device via said input/output device, the input/output device including a mechanical or static relay section ON/OFF outputting the control command to said component control device and an insulated input section ON/OFF inputting thereto data input from said component control device.

11. ~~A digital protection and control device as set forth in claim 1;~~ A digital protection / control device, comprising:

a digital data merging unit configured to take in, via a transmission medium, digital output from one sensor unit or a plurality of sensor units detecting AC electricity quantities of main circuits of substation main equipment and to merge the inputted digital data;

a protection / control unit configured to output a control signal for at least one of protection and control of said substation main equipment based on the digital data outputted from said digital data merging unit;

a communication unit for component control devices configured to transmit to said protection / control unit component monitor data outputted from one component control device or a plurality of component control devices controlling said substation main equipment, and to transmit the control signal outputted from said protection / control unit to said component control device(s), the component monitor data and the control signal being transmitted via a transmission medium;

a process bus communication unit configured to relay data to/from at least a part of said protection / control unit, said communication unit for component control devices, and said digital data merging unit from/to an external process bus; and

a parallel transmission medium configured to couple at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control devices, and said process bus communication unit to one another, wherein:

data exchange among at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control devices, and said process bus communication unit is based on a multimaster mode; and

wherein at least a part of a transmission path of said digital protection [[and]] / control device is constituted of an optical transmission portion, said digital protection[[and]] / control device further comprising:

a fan unit configured to send an air to said optical transmission portion under a predetermined condition.

12. (Currently Amended) ~~A digital protection and control device as set forth in claim 1;~~ A digital protection / control device, comprising:

a digital data merging unit configured to take in, via a transmission medium, digital output from one sensor unit or a plurality of sensor units detecting AC electricity quantities of main circuits of substation main equipment and to merge the inputted digital data;

a protection / control unit configured to output a control signal for at least one of protection and control of said substation main equipment based on the digital data outputted from said digital data merging unit;

a communication unit for component control devices configured to transmit to said protection / control unit component monitor data outputted from one component control device or a plurality of component control devices controlling said substation main equipment, and to transmit the control signal outputted from said protection / control unit to

said component control device(s), the component monitor data and the control signal being transmitted via a transmission medium;

a process bus communication unit configured to relay data to/from at least a part of said protection / control unit, said communication unit for component control devices, and said digital data merging unit from/to an external process bus; and

a parallel transmission medium configured to couple at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control devices, and said process bus communication unit to one another, wherein:

data exchange among at least parts of said digital data merging unit, said protection / control unit, said communication unit for component control devices, and said process bus communication unit is based on a multimaster mode; and

~~wherein~~ the control signal to said component control device from said digital protection ~~[[and]]~~/control device is a command constituted of a plurality of bits and constituted based on a predetermined rule, and said component control device receiving the command detects an error in the command.

13. (Currently Amended) A digital protection ~~[[and]]~~/control device as set forth in claim 1, wherein:

said protection ~~[[and]]~~/control unit has both of a protection function and a control function ~~is divided into a device having a protection function and not having a control function and a device having the control function and not having the protection function.~~